

The University of Chicago

COST ACCOUNTING FOR
LIBRARIES: ACQUISITION AND
CATALOGING

A PART OF A DISSERTATION SUBMITTED TO
THE FACULTY OF THE GRADUATE LIBRARY
SCHOOL IN CANDIDACY FOR THE DEGREE
OF DOCTOR OF PHILOSOPHY

1936

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ROBERT A. MILLER

MANY types of facts have value in the administration of an enterprise. Of the many types, however, cost facts are most commonly needed. For the determination of costs in industry and business the specialized techniques of cost accounting were perfected. These techniques have been adapted to the peculiar problems of cost measurement in non-profit enterprises, notably municipal government and education.¹

Libraries, no less than other types of educational and non-profit institutions, require facts for purposes of management. While service statistics have been collected by libraries for many years, there has seldom been any attempt to express these services in terms of cost or to measure service against cost or quality or any other criterion. Standards of library service and performance that do exist have been the subject of criticism within and without the profession.

These experts . . . consider them inadequate for the purposes which they are intended to serve. They insist that these standards do not reveal the exact unit costs of different activities, that they cannot be used effectively in measuring efficiency of operation, and that they do not greatly aid the library administrator in shaping and directing the policies of his library, or in understanding the interests and meeting the needs of individuals and special groups. Furthermore, they say they do not enable the taxpayer to know whether the services provided through the library are worth what they cost. What they actually mean is that libraries do not have devices at present by which they

¹ The trend in municipal service has been well summarized in T. H. Reed, *Municipal government in the United States* (New York: Appleton-Century Co., 1934), pp. 332-48. Techniques of cost accounting in institutions of higher learning are illustrated in the National Committee on Standard Reports for Institutions of Higher Education, *Financial reports for colleges and universities* (Chicago: University of Chicago Press, 1935), and in many studies, of which J. D. Russell, "Efficiency in college management," *Bulletin of the School of Education*, Vol. VI, No. 6 (Bloomington, Ind.: Indiana University, 1931), is an excellent example.

can accurately measure their administrative effectiveness or social significance. The next ten years will witness the development of a body of costs and measurements for various types of library service which will meet these adverse criticisms and enable the library to justify its support upon a basis of substantial facts, rather than of unproven assumptions. To a philosophy of action and specific objectives will be added accurate measures of performance—all of which are essential to sustained progressive achievement.²

Yet questions on the cost of library operations and library services have been of continuing interest to the library profession if one may judge from the attention given to questions of cost in library periodicals and reports. From this attention one infers that cost data can be of use to the library administrator. If the data are exact and sufficiently analyzed, the librarian is better equipped therewith to plan and review the financial program of his organization. He enjoys a clearer view of the relative expenditures for each part of the library plant and, consequently, can more clearly appraise the value of each part to the whole and compute the proportionate financial outlay. The advisability of contemplated changes in practice or the merit of a given policy can often be better understood when the essential facts of cost have been determined.

In planning future programs or the coming-year's work (as in a budget), the librarian should find analyzed costs helpful, for they will enable him to predict the financial burden that each cost-examined operation will carry. In reporting annual progress, he will be able to use unit costs for brief comparisons because they offer a convenient statement of financial data and history and are as easily understood as stated.

Efficiency demands that the library organization be well planned, that functions be well organized, and that operations be grouped as to function. Each process or series of operations will, necessarily, be routinized to a large extent in the typical library. It is common to find that this has been done. To one who would seek to know the organization thoroughly it would seem proper to inquire next if the costs of the routinized operations had been determined and if they had been totaled into a cost for an entire service or for the complete function. With

² L. R. Wilson, "The next fifty years," *Library journal*, LXI (1936), 256-57.

cost of the operation or series of operations determined, it would be pertinent to inquire if maximum efficiency in the performance of the operation had been reached. Not until maximum efficiency has been reached or indicated can a complete evaluation of the operation be made.

Measurement is, thus, of two kinds, the first being antecedent to the second. Unless an operation or service has been measured in terms of cost, the cost of the operation or service cannot be measured against a criterion of quality or other standard. Libraries are generally lacking in both kinds of measurement. This investigation is concerned with the former, or cost measurement, for not until this type of measurement has been established can the more critical judgments be made.

A demonstration of a cost-finding technique to cover all items of cost for all library operations is not attempted in this study. This has recently been done by Mr. Rider.³ The unit costs that he and earlier investigators have reported, however, have been so inclusive as to obscure the differences in process and in type of material that demand measurement and comparison. In other words, analyzed costs promise to be most useful. Professional catalogers recognized this fact in 1925, when they brought forward a plan for a cost determination of cataloging in its different processes.⁴ The main purpose of this investigation is to prove that the analysis of costs is feasible.

In undertaking this study, it has been necessary to impose certain limitations which may be briefly stated. The technical processes (acquisition and cataloging, excluding all binding operations) were selected as significant in point of cost and process. Cataloging costs, particularly, have been the subject of much interest and speculation. The routines for the technical processes, especially in reference and research libraries, are complex, and, if they prove susceptible to analyzed cost determination, there would appear to be reason for an extension of cost-accounting techniques to other library routines.

As Mr. Rider has indicated, labor costs appear to be the crux

³ Fremont Rider, "Library cost accounting," *Library quarterly*, VI (1936), 331-81.

⁴ "Plan for an investigation into and report on the cost of cataloging," *Bulletin of the American Library Association*, XIX (1925), 278-86.

of the entire cost question. It is only necessary to maintain proper records and employ proper arithmetical and accounting practices to distinguish the other items of cost, material, and overhead. Because the procedures in calculating material and overhead costs have been well established in industrial cost accounting and because the mechanics of the distribution of these costs to total library costs have been illustrated by Mr. Rider, they are omitted in this study.

To arrive at the detailed costs of the technical processes in any library it is necessary to routinize the operations completely. By doing so, the significant points of cost and process can be discerned. The development of time sheets on which to record labor time at these points logically follows. The time expenditures cumulated on such sheets can be totaled and divided by total output to give unit times. Time expenditures can also be translated into labor costs and expressed in terms of unit costs. In brief, then, this is the procedure followed in this investigation applied specifically to a large university library (hereafter called the "test library") which is assumed to be typical on the basis of evidence at hand.

ORGANIZATION OF THE TECHNICAL PROCESSES IN THE TEST LIBRARY AND SIGNIFICANT POINTS OF COST

Acquisition.—Acquisition activities were centralized in the order department of the test library for all types of book acquisition, except exchange, and for much of the work connected with serial (continuation) and document acquisition. The departments for serial and document service aided in acquiring their respective types of material by checking the order for duplication and by supplying trade and bibliographical information. The routines for receipt of serials, continuations, and documents were complicated in some instances because both order and service departments maintained checking files.

To understand, therefore, the interrelationships of the departments sharing in acquisition processes, it proved convenient to routinize the work as to type of material, namely, book, serial, and document. Differences in routine also appeared as to meth-

od of acquisition, i.e., the flow of orders for items to be purchased and the receipt of these items through the various operations were different from the flow of free materials.⁵

In general, however, the pattern of order and receipt activities for purchased books served as a base for the description of the other routines differentiated as to type of material and method of acquisition. Purchased serials and continuations varied only in their pattern of flow by an additional checking before and after receipt. Periodical receipts were checked only in the service department. The checking of purchased documents before order placement was not duplicated in the order department, although checking of receipts was. The pattern for books acquired free was also much the same as that for purchased books. The routines for free serials and free documents, however, showed a reallocation of much of the work from the order department to the service departments, the main obligation of the order department being to expedite the material to be cataloged.

Assuming that a differentiation was possible in the "free" routines between those operations that partook of *ordering* and those that resembled *receiving* operations in the purchase routines, the following analyzed costs of acquisition may be conceived:

The cost of ordering a book (or separate) to be purchased

The cost of receiving a book (or separate) purchased

The cost of ordering a book (or separate) received free

The cost of receiving a free book (or separate)

The cost of ordering a serial (or continuation) to be purchased

The cost of receiving a purchased serial (or continuation)

The cost of receiving a periodical issue

The cost of ordering a serial (or continuation) received free

The cost of receiving a free serial (or continuation)

⁵ For detail of routines and further explanation see chap. iv of R. A. Miller, "Cost accounting for libraries: a technique for determining the labor costs of acquisition and cataloging work." Unpublished doctoral dissertation, Graduate Library School, University of Chicago, December, 1936.

The cost of ordering a document to be purchased

The cost of receiving a purchased document

The cost of ordering a document received free

The cost of receiving a free document

Interesting as these costs would appear to be, it proved impractical throughout the test library to separate acquisition time according to types of material. Thus, while time spent in the service departments for the acquisition of serials and documents might be charged directly to the acquisition of a single type of material, in the order department the work was not organized in such a way as to separate labor time by type of material handled. It was assumed that cost differences occasioned by differences in material were not significant. The same assumption was applied to the differences in the method of acquisition. In other words, all units of work—book, serial, or document, purchased or free—were regarded as requiring equal attention in the order department.

There were, nevertheless, significant points or groupings of labor time in the order and receipt routines. Examination of the routine for purchased books, the base routine, revealed five suggestive categories.

Order card received	}	Preliminary activities
Order card stamped		
Order card marked by department		
Order card placed in preliminary file		
Unchecked order cards alphabetized	}	Checking
Order cards checked against catalog		
Order cards checked against "Orders out" file		
Order cards checked against "Orders received"		
Order cards checked against "Ready to order"		
Order cards prepared bibliographically	}	Ordering
Order cards filed in "Ready to order"		
Order cards sorted as to agent		
Order cards typed into order letters		
Order letters revised and mailed		
Order cards stamped and filed		

Shipment received and unpacked	}	Receiving
Receipts checked		
Revision		
Order cards filed in "Orders received"		
Invoices filed		
Items placed on truck		

Before discussing the five categories, or groups, of operations, it should be clear that the labor times and, hence, labor costs could be determined for any one of the operations listed. Indeed, any one of the operations might be broken down into constituent work elements, each of which is amenable to time recording. Detail to this extent would make the necessary records long and cumbersome. It is doubtful if accuracy in noting the time spent on each operation or element could be achieved without the constant use of a stop watch. Detail of this type is more profitably examined by the time-and-motion-study techniques successfully employed in scientific management.

It would appear, then, that the details or the points of cost to be emphasized rested upon arbitrary decisions. Yet these arbitrary decisions were based upon an appreciation of the particular costs and combinations of costs that are useful to administrators. In support of this statement, an extended argument will be made for two of the suggested categories, namely, checking and bibliographical preparation.

Sound administration can exercise a good deal of "control through information." Purely from the desire to know what constitutes the major parts of the cost of ordering an item, one might ask how much it costs to check an order through the library records. Or, more to the point, how much is spent to avoid duplication? Once the answer to this query has been made, certain observations follow. If professional assistants are now performing this type of work, how much does it cost per order or per card? How much does it cost per order or per card when performed by a clerical worker? What is the percentage of error with each type of personnel? Questions of this sort cannot be answered without analyzed cost data. Another implication revolves on the number of orders found to be duplicate.

How much does it cost to discover duplication in total? What burden does the library assume because of the book selector's lack of acquaintance with the library collections, and from what quarters does the burden arise?

Even more pertinent are the questions that arise concerning the cost of preparing the order with the bibliographical information that will aid the agent in locating the exact title desired and in some instances assist the cataloger in her work. The policy of the test library was to check all order cards carefully as to the information they carried. In at least one other university library this check is not made, it being assumed that the selector has correctly transcribed the author and title of the book together with such trade and bibliographical information as was available to him. How much, therefore, does the test library pay for this painstaking search? How many duplications are found later in the cataloging processes? For in the test library the cataloging routines showed that much searching and checking of a similar nature was done. Segregation of time spent by catalogers in this type of activity provided evidence of duplication of effort.

While the grouping of operations and the recording of time on each group do not answer these questions completely, they serve as a starting-point for what would appear to be interesting studies. Information of this type should be helpful in the efficient administration of the technical processes. Any analysis or isolation of cost offers needed insight.

The separation of these two groups of operations from the others that constitute the whole of the ordering process naturally defined the remaining activities into two groups, the preliminary activities and the concluding activities, the latter being termed herein "ordering." Receiving activities were considered as a whole.

A time sheet constructed to furnish the order-department personnel with a form for the recording of time spent only in the five categories of acquisition operations would omit many other allied activities. Not only for the convenience of workers in the allocation of their time to a specific object, but also to

provide a complete picture of the work of the order department, additional categories of work were included, as Figure 1 shows. Figures 2 and 3 represent the time sheets used in the two service

Name.....

Week.....

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
1. Receiving cards, etc.						
2. Checking against records						
3. Supplying bibliographical data						
4. Ordering.						
5. Receiving.						
6. Bookkeeping, etc.						
7. Clearing order files.						
8. Returning order cards to selectors. .						
9. Handling catalogs.						
10. Filing.						
11. L.C. and F.O. orders*.						
12. Typing order letters.						
13. Other typing—Order dept.						
14. Nondepartmental typing.						
15. Foreign theses work.						
16. Wrong book supplied.						
17. Defective copy routine.						
18. Checking periodical bills.						
19. Periodical and continuation renewals. .						
20. Book selection.						
21. Professional reading.						
22. Checking reports, etc.						
23. Inquiries.						
24. Administration.						
25. Unaccounted time.						
26. Keeping this record.						
27. Other (specify)						
28.						
Daily total.						

* Weekly total units. 11. L.C. titles..... F.O. slips.....

WEEKLY RECORD

	Books	Serials	Documents
Number titles ordered.			
Number pieces received by purchase.			
Number pieces received free.			

FIG. 1.—Time sheet for order department

departments for acquisition activities. Time spent on cataloging activities, included in special time sheets, is discussed below.

Name.....

Week.....

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
1. Arranging for publication exchange.....						
2. Ordering piece exchange*.....						
3. Outgoing exchange.....						
4. Receiving periodicals*.....						
5. Checking periodicals.....						
6. Receiving piece exchange*.....						
7. Checking periodical bills.....						
8. Claiming.....						
9. Card catalog work.....						
10. Keeping this record.....						
Daily total.....						

* Weekly total units. 2. Number of pieces..... 4. Number of pieces.....
6. Number of pieces.....

FIG. 2.—Time sheet for serials service department

Name.....

Week.....

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
1. Checking orders against records.....						
2. Supplying bibliographical data.....						
3. Arranging for material free from publication offices.....						
4. Ordering piece exchange.....						
5. Outgoing exchange.....						
6. Receiving*.....						
7. Checking in.....						
8. Card catalog work.....						
9. Notes to catalogers.....						
10. Keeping this record.....						
Daily total.....						

* Weekly total units. 6. Number of pieces.....

FIG. 3.—Time sheet for documents service department

Cataloging.—All cataloging in the test library was centralized in the catalog department, with the exception of filing in the two service departments mentioned and occasional aid furnished by the documents personnel.

As in libraries of the same size and type, the cataloging processes in the test library differed according to the type of material cataloged. Separate routines had been established for the cataloging of new books, new serials (including documents), added copies, added volumes (serial), new editions, local typed theses, and for short-form cataloging. These processes of cataloging, together with the recataloging of books and serials, presented themselves immediately as containing operations for which labor cost should be determined. Despite their significance, the costs of different cataloging processes have never been reported in library literature. Process costs have been obscured in the customary per-volume figure for cataloging, secured by dividing total salaries by total accessions. Because the charge of inclusiveness might fairly be leveled, in turn, at the various process costs, the routines for cataloging new books and new serials and for recataloging books and serials were analyzed further. The following groupings in the basic routine were suggested and will be discussed:

Searching in the depository catalog	}	Searching and checking
Searching in the reading-room catalog		
Verifying title, etc.		
Starting the copy slip		

Establishing difficult main entries

Establishing difficult editions

Analyzing

Subject heading	}	Classification and subject heading
Classification		
Assigning book numbers		
Preparing added entries		
Shelf-listing		

Completion of copy slip, including description of title, imprint, collation, series notes, contents, etc.	} Completion of cataloging
Preparing Library of Congress and foreign-order card slips	
Revision of cataloging	
Revision of card work	

The first group of operations suggested for separate cost determination is preliminary to the actual cataloging process. In the test library these operations were performed by professional catalogers. The question might well be raised as to whether the costs of these operations were out of proportion to the remainder of the costs. Could the work have been done as effectively by clerical workers? How much did it add to the cost of the detailed searching and checking performed by the order-department personnel?

The second element of cost, and one that appeared to be particularly significant in view of the variations in cataloging policy among different libraries, dealt with the establishment of main entries. For the purposes of a comparative study these costs should not be limited to those entries conceived to be difficult. Not only would this result in a distorted sample of the work but it would lead to difficulties in definition. However, for the test library the administration felt it would be impossible to keep a time record for simple main entries. It was, for example, the policy in the test library to accept as authoritative the entry on a Library of Congress card. The time involved in the establishment of such an entry was, of course, small and difficult to measure, in that the card had been pulled for other purposes as well. Difficult main entries were considered to be those requiring a more extended investigation, or, as the results revealed, a search of more than five minutes each.

It should be noted that it is on matters of policy in cataloging practice that cataloging costs between different libraries are likely to vary. Therefore, it is necessary that the cost-account-

ing technique isolate points of possible difference. Comparison is facilitated by such an analysis.

The third operation suggested for separate calculation was the establishment of difficult editions. Much that has been said above with respect to main entries is pertinent to editions, although with libraries of the same type and approximate size it is likely that policy and costs will show some agreement.

With respect to policy and cost of analyzing, another point of possible difference was emphasized. Libraries differ greatly on policies pursued in relation to analytics and the extent to which they are employed. The isolation of time spent in analyzing was repeated under the cost examination of added volume (serial) work.

Assigning classification numbers and subject headings appeared as one of the main divisions in the cataloging process. Perhaps the cost of no single group of operations within the entire cataloging process has been the subject of so much conjecture. Some large libraries have gone so far as to make a division of labor at this point, establishing a subdivision within the cataloging department for assigning classification numbers and subject headings to items. Whether such an organization is more economical in dollars and cents than one in which one person carries the item through all operations cannot be answered concretely until the costs are determined for both types of organization in a strictly controlled experiment. It is clear, of course, that where one worker carries the item through all cataloging operations there is difficulty in defining closely the time that is given to classification and subject-heading operations and to no other activity, for in examining the book for one purpose other information comes to light. Nevertheless, the approximate labor time and labor cost promised to be useful as a fact in library management. An extraneous operation, the preparation of added entries, was included in this grouping of operations as a local convenience.

The group of operations summarized as "completion of cataloging" brings together the concluding activities in the catalog-

ing process, excluding revision. These operations ordinarily formed a compact piece of work.

Following the cataloging process proper came two types of revision, each of which was separate in point of time from the main operations and thus conveniently isolated. Revision of cataloging was undertaken in the test library by designated workers who devoted consecutive time to the task. Time records, therefore, for the labor cost of cataloging revision were simply kept. It would have been desirable to secure at the same time a record of the time spent by catalogers in correction, a possible objective measurement for the evaluation of the efficiency of the individual worker. Difficulties in keeping the time, however, prevented this record being kept in the test library.

The second revision operation, the revision of card work, was undertaken in the test library by the cataloger originally responsible for the work. Because of its separation in point of time from the cataloging process and because this type of revision was customarily done on a quantity of cards in a single period of time, it was set aside for cost determination. The mechanics of reproducing the operations established above on a time sheet and the method for subdividing them into categories for new books, new serials, recataloged books, and recataloged serials may be seen in Figure 4. Each time sheet has columns for the six work days of the week. Each of these is further divided into columns headed "new" and "recataloged." Because each worker was to keep her own record, and because no cataloger in the test library dealt with both types of material, book and serial, there was no confusion in distinguishing between book and serial time records. Had one cataloger dealt with both books and serials, it would have been necessary for her to have kept separate time sheets, one for books and one for serials.

Analysis of the other processes of cataloging was not carried out on the time sheet beyond separating them from the routines just analyzed. Thus, a single heading sufficed for short-form cataloging. Because certain operations in the different processes

Name.....

Week.....

	MON.		TUES.		WED.		THURS.		FRI.		SAT.	
	New	Recat.	New	Recat.	New	Recat.	New	Recat.	New	Recat.	New	Recat.
1. Searching and checking.....												
2. Establishing main entry*.....												
3. Establishing editions*.....												
4. Completion of cataloging*.....												
5. Analytics*.....												
6. Classification and subject heading..												
7. Revision of card work.....												
8. Revision—Books.....												
9. Revision—Serials.....												
10. Revision—New editions.....												
11. Revision—Added volumes.....												
12. Revision—Added copies.....												
13. Filing in shelf-list and revision*....												
14. Revision of filing in depository catalog.....												
15. Revision of filing in reading-room catalog.....												
16. Added volume analytics (non-L.C.)*..												
17. Cdp work and revision*.....												
18. Analyzing for L.C. and revision....												
19. Withdrawal.....												
20. Rare-book tracing, etc.....												
21. Local typed theses and revision*....												
22. Short-form cataloging and revision*..												
23. Book selection.....												
24. Subject-heading work.....												
25. Helping readers.....												
26. Administration.....												
27. Replacing old cards.....												
28. Unaccounted time.....												
29. Keeping this record.....												
30. Other (specify).....												
Daily total.....												

* Weekly total units. 2. Entries..... 3. Editions..... 4. New: titles.....; volumes.....; cards..... 4. Recat: t.....; v.....; cds..... 5. T.....; cds..... 13 Cards..... 16. T.....; cds..... 17. T..... 21. New; added..... 22. T.....; v.....; cds.....

FIG. 4.—Time sheet for professional catalogers and revisers

of cataloging—e.g., added copies, added volumes, and new editions—were undertaken by student and clerical assistants, ap-

Name.....

Week.....

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
31. Filing in reading-room catalog*						
32. Filing in depository*						
33. Filing and card work in departmental libraries.						
34. Other work on catalogs.						
35. Correcting temporary slips, R.R. catalog.						
36. Accessioning and mechanical preparation.						
37. Marking and revision.						
38. Marking—rebinds.						
39. Messenger and distribution.						
40. Card removal.						
41. New-edition work*						
42. Added volumes—L.C. analytics*						
43. Added volumes—other work*						
44. Added copies work*						
45. Erasing cards.						
46. Filing and revision of miscellaneous files.						
47. Card and slip exchange.						
48. Cutting stencils and running*						
49. Typing cards, etc.*						
50. Other typing for catalogs.						
51. All other typing.						
52. L.C. card work.						
53. Student recataloging*						
19. Withdrawal.						
21. Local typed theses.						
24. Subject-heading work.						
29. Keeping this record.						
30. Other (specify)						
Daily total						

* Weekly total units. 31. Cards..... 32. Cards..... 41. Titles.....; volumes.....; cards..... 42. T.....; cds..... 43. Volumes..... 44. Volumes..... 48. Stencils..... 49. Cards..... 53. T.....; v.....; cds.....

FIG. 5.—Time sheet for clerical and student assistants (catalog department)

propriate headings appeared on the clerical time sheet, Figure 5. Revision for these processes, being performed by professional

catalogers, appeared on the time sheets for catalogers, Figure 4. The remainder of the headings on both time sheets consisted of categories of work which not only revealed the range of the work undertaken in the catalog department but aided the workers in recording the time devoted to a specific task.

TESTING AND TABULATION OF THE TIME SHEETS

The time sheets were put into actual use in the test library during the period from March 9 to May 2, 1936, a total of eight weeks. This period was assumed to be typical of the normal operating year.

Each worker in the technical and service departments concerned was supplied with time sheets and a sheet of general instructions on the manner of keeping the record. Entries as to total time spent on separate categories of work during the day were made only at the end of the day. Statistics on the number of units handled under each category marked with an asterisk on the time sheet were tallied as convenient, but recorded only at the end of the week.

Directions were given that time should be recorded to the nearest five minutes, except for time expended in the keeping of the time-sheet record. Time to the latter account was requested to the nearest minute. Although a strict accuracy could not be achieved without a stop watch, it was assumed that the time measurements were reliable and that errors in the self-recording of time would compensate. At points where division of time was difficult, as in the separation of time spent in classification and cataloging (the cataloger carrying the item through all of the operations), approximations were secured. They were assumed to be indicative, with errors compensating.

The translation of labor time into labor cost was done at an average hourly rate of pay. The annual salary of each worker was divided by eleven, the number of working months. The average number of working hours in the month was computed as 174.5.

As each worker was instructed to record the amount of daily time actually spent in working, it was not unusual to find that

the weekly totals varied with the expected weekly total. In the time charges, therefore, this meant that overtime was being charged to the exact category of work on which it took place, but that undertime was not being recorded. A separate account was established in the tabulation, therefore, for overtime and undertime for purposes of adjustment. Undertime, including added vacation, time for illness, and conference privileges, was considered an administrative charge and was calculated in the operating costs. Undertime in the form of regular vacation was not an administrative charge under the method employed in determining the hourly rate of pay. In the accounting, overtime was considered a correction item on undertime. The specific amount of administrative charge for undertime was thus: total undertime less regular vacation accounts less overtime. As with other time segregations, net undertime was expressed in dollars and cents.

Few difficulties were experienced in the final tabulations. As it was not the purpose of the study to present cost figures which might be interpreted as standards, only a few of the resulting totals will be given (Tables 1-6). These totals are intended to testify only to the effectiveness of the records employed. It will be noted that unit times, as well as unit costs, are presented for cataloging costs. The one was as easily computed as the other. Unit times are, perhaps, less meaningful than unit costs at the present writing, but there is reason to believe that they will assume importance in any comparison in which salary differences must be adjusted.

The possibility of expressing accurately in terms of a single unit the cumulated costs of all acquisition work proved to be remote because of the differences arising in the different types of material acquired. Table 1 shows that in the order department the cost of receiving a piece was \$0.23. The service department for documents received 3,823 free pieces at a labor cost of \$0.04 per piece, but only 642 pieces were forwarded to the order department. The service department for serials received 4,456 pieces at an approximate labor cost of \$0.03 per piece, but only 484 serial pieces were received in the order de-

partment. When the latter unit costs are added to the order-department unit cost, the resulting total fails to represent the labor time and cost expended on pieces acquired in the service departments that are not sent on for cataloging. If, on the other hand, total labor cost in all departments is divided by total receipts of all types, the resulting average (\$.05) is not a total that can be analyzed into constituent parts.

It follows from this that difficulties will also attend the calculation of a single unit figure intended to represent the total

TABLE 1
UNIT COSTS FOR ACQUISITION IN THE ORDER DEPARTMENT

Operation	Units	Total Direct Labor Cost	Direct Labor Unit Cost	Allocated Indirect Labor Cost	Total Labor Cost	Total Labor Unit Cost
<i>Ordering:</i>						
Preliminary activities...	929	\$ 6.49	\$0.007	\$ 6.61	\$ 13.10	\$0.014
Checking.....	916	88.44	.097	92.84	181.28	.198
Bibliographical preparation.....	929	76.24	.082	80.79	157.03	.169
"Ordering".....	929	53.61	0.058	50.42	104.03	0.112
Total.....		\$224.78	\$0.244	\$230.66	\$455.44	\$0.493
<i>Receiving:</i>						
Total*.....	2,111	\$246.17	\$0.114	\$237.98	\$484.15	\$0.229

* Does not include free documents.

labor cost of acquiring and cataloging a reading unit. Nevertheless, partial or process costs are significant in defining the differences in labor and cost that exist in the technical processes.

Tables 2 and 3 summarize the direct labor times and costs of cataloging new books and recataloging books. Table 4 reveals certain unit times and costs calculated from the data made available through the use of analyzed time sheets. Table 5 shows the direct and indirect labor costs of different types of cataloging.

Tables 1 and 5 reveal that a large percentage of total labor time expended in acquisition and cataloging work was of an indirect character. Indirect labor was conceived in this study

to include labor spent on tasks which were general in nature, as administration, and which were not susceptible of direct application to a single process. Such types of labor as filing, marking,

TABLE 2
DIRECT LABOR TIME AND COST FOR CATALOGING NEW BOOKS

OPERATION	TOTAL TIME (IN HRS. AND MIN.)	TOTAL COST	UNIT TIME (IN MIN. AND SEC.)		UNIT COST	
			Title (994 Units)	Volume (1,365 Units)	Title (994 Units)	Volume (1,365 Units)
Searching and checking.....	209—57'	\$ 150.67	12' 40"	9' 14"	\$0.152	\$0.110
Establishing difficult main entries.....	47 20	40.37	2 51	2 5	.041	.030
Establishing difficult editions....	25 58	23.23	1 34	1 8	.023	.017
Completion of cataloging.....	442 58	343.67	26 44	19 28	.346	.252
Analyzing.....	15 30	15.46	0 56	0 41	.016	.011
Classification and subject heading.....	369 47	293.40	22 19	16 15	.295	.215
Revision of cataloging.....	259 38	254.69	15 40	11 25	.256	.186
Revision of card work.....	65 54	53.00	3 59	2 54	0.053	0.039
Total.....	1,437—2'	\$1,174.49	86' 43"	63' 10"	\$1.182	\$0.860

TABLE 3
DIRECT LABOR TIME AND COST FOR RECATALOGING BOOKS

OPERATION	TOTAL TIME (IN HRS. AND MIN.)	TOTAL COST	UNIT TIME (IN MIN. AND SEC.)		UNIT COST	
			Title (651 Units)	Volume (958 Units)	Title (651 Units)	Volume (958 Units)
Searching and checking.....	121—7'	\$ 93.90	11' 10"	7' 35"	\$0.144	\$0.098
Establishing difficult main entries.....	10 15	6.87	0 57	0 39	.010	.007
Establishing difficult editions.....	1 40	1.28	0 9	0 6	.002	.001
Completion of cataloging.....	140 29	107.86	12 57	8 48	.166	.113
Analyzing.....	13 24	10.46	1 14	0 50	.016	.011
Classification and subject heading.....	92 33	73.50	8 32	5 48	.113	.077
Revision of cataloging.....	89 42	90.32	8 16	5 37	.139	.094
Revision of card work.....	34 38	27.77	3 11	2 10	0.043	0.029
Total.....	503—48'	\$411.96	46' 26"	31' 33"	\$0.633	\$0.430

accessioning, keeping the time record, etc., must be distributed to the various types or processes of cataloging.

The allocation of indirect labor time and cost to both acquisition (Table 1) and cataloging processes (Table 5) proceeded on

TABLE 4
DIRECT LABOR TIME AND COST FOR ESTABLISHING
ENTRIES, EDITIONS, AND ANALYTICS*

Operation	Number of Units	Total Time (in Hrs. and Min.)	Total Cost	Unit Time (in Min. and Sec.)	Unit Cost
<i>Books:</i>					
Main entries.....	198	50—20'	\$40.97	15' 15"	\$0.21
Editions.....	91	24 1	21.67	15 50	.24
Analytics.....	165	28 54	25.92	10 30	.16
<i>Serials:</i>					
Main entries.....	5	0—50	0.79	10 0	.16
Analytics.....	75	29 35	29.53	23 40	0.39

* Time and cost for which units were not supplied by workers are omitted from this table.

TABLE 5
CUMULATED LABOR COSTS WITH UNIT COSTS FOR TYPES OF CATALOGING

TYPE OF CATALOGING	NUMBER OF UNITS		DIRECT LABOR COST	DIRECT LABOR UNIT COST		INDIRECT LABOR COST	TOTAL LABOR COST	TOTAL LABOR UNIT COST	
	Title	Volume		Title	Volume			Title	Volume
New books.....	994	1,365	\$1,174.49	\$1.182	\$0.860	\$ 716.23	\$1,890.72	\$1.902	\$1.385
New serials.....	73	399	255.54	3.500	.640	125.73	381.27	5.223	0.956
Recataloged books*.....	705	1,027	445.25	0.632	.433	288.19	733.44	1.040	.714
Recataloged serials.....	24	193	51.66	2.153	.267	25.43	77.09	3.212	.399
Short-form cataloging.....	32	32	8.45	0.260	.260	5.65	14.10	0.441	.441
New editions.....	68	131	39.21	0.577	.299	46.62	85.83	1.262	.655
Added copies.....		278	29.95		.108	35.32	65.27		.235
Added volumes.....		1,206	166.38		0.139	169.52	335.90		.279
Total.....		4,631	\$2,170.93		\$0.469	\$1,412.69	\$3,583.62		\$0.774

* Includes student recataloging.

the basis of total direct labor time. When indirect costs are applied to the processes, it is obvious that the total charge grows less exact. This is unavoidable, unless an undue number of records are kept, and leads to the suggestion that, if the record stops short with direct labor costs, more exact and verifiable

data are had. These data would seem to serve best for any sort of interlibrary comparison, undistorted by arbitrary allocations. This reasoning does not indicate, necessarily, the wisdom of grouping all indirect labor into one category. The time sheets employed in the test library analyzed indirect labor in some detail. Such an analysis is valuable in revealing the nature of the expenditures necessitated by allied activities and obligations. Thus the catalog department in the test library spent \$270.06 in revision and correction of subject headings. If the cost data are to be of use to the administrator who desires to know the range and costs of allied activities, a single broad grouping of indirect

TABLE 6
TIME AND COST OF KEEPING TIME RECORDS

Personnel	Number	Total Time (in Hrs. and Min.)	Total Cost	Cost per Worker per Week	Time per Worker per Week (in Min. and Sec.)
Student.....	28	18—16'	\$ 5.48	\$0.024	5' 0"
Professional and clerical..	28	117 39	85.02	.380	31 30
Total.....	56	135—55'	\$90.50	\$0.202	18' 12"

labor will not serve. If such data are to be used comparatively, not only will analyzed indirect labor costs prove helpful in evaluating differences in costs but they will serve also to define, by inclusion, those operations excluded from what is considered to be direct labor (labor spent on a single process).

Table 6 presents the time and cost of keeping the time records in the test library during the eight-week period.

While the study did not seek to examine critically those practices of the test library which gave rise to unexpected costs, at least one outstanding fact may be discussed as having more than a local implication. The policy of the test library to "search" carefully each order before placement is typical of many libraries. Searching consists of two distinct operations: "clearing" the order through all library records in order to avoid duplication, and preparing the order card with trade and bibliographi-

cal information. The direct labor costs for these operations were found to be \$.097 and \$.082, respectively. Moreover, the costs of "searching" were not at an end with the costs found in the order department, for in the catalog department the direct labor cost of "searching and checking" new books was \$.152 per title, and for "establishing difficult editions" \$.023 per title. The total direct labor costs for the general activity were, thus, in the neighborhood of \$.35 a title. This figure is so large as to demand future study. The implication is clear that a capable "searcher" might be employed to do the work once and for all at a cost lower than is possible in traditional organizations with a division of labor.

PROBLEMS FOR FURTHER INVESTIGATION

Many questions of cost were touched but briefly in the study. With the validation of analyzed labor costs and the evidence that their determination is not impractical, it is suggested that those questions which have already been the subject of speculation be re-examined with a view to immediate solution.

The organization of the catalog department in the test library prevented an attack on the question of difference in cost in cataloging new items with and without Library of Congress cards. There is considerably more than subjective judgment on which to base the conclusion that it costs less to catalog books when Library of Congress cards are available. In an attempt to state definitely how much less, tests were made several years ago in selected libraries to show the differences in cost that exist.⁶ These tests, however, were open to much the same sort of criticism that was made of the Cataloging Test of 1914,⁷ there having been, apparently, no control of conditions and no precaution taken to avoid a "race against time." Figures gathered over a longer period of time would have more value but would be difficult to procure in that no library would willingly undertake to catalog its new books twice for the sake of the argu-

⁶ American Library Association Co-operative Cataloging Committee, *Report to the General Education Board* (New York, 1932), p. 29.

⁷ A. G. S. Josephson, "Committee on Cost and Method of Cataloging," *Library journal*, XXXIX (1914), 598-99.

ment. There is, however, at least one reference library so large as to have subdivided its cataloging organization into two sections, one for the cataloging of books having Library of Congress cards, and the other for the cataloging of books lacking Library of Congress cards. Direct labor times, or direct labor costs with salary differences equated, gathered over an extended period of time and for strictly defined operations in organizations of this type would aid in a definitive answer to the question. A final answer, however, must take into account and equate the differences in the difficulty of the books cataloged by each method.

It is likely that differences in subject content and language will make for cost differences in the cataloging of new books. Such a differentiation was not approached in this investigation. Comparative studies, which will be discussed below, may be dependent upon differences of this kind.

The consolidations of operations necessary to the construction of the time sheets employed in this investigation may also be made the subject of an intensive study. As pointed out, the technical operations are composed of many work elements, each of which is sufficiently distinct in character to be studied, albeit by the stop-watch method. The techniques of time-and-motion studies might be profitably adapted to the examination of the most efficient method for the performance of specific work elements.

This line of thought carries one into the larger field of scientific management, a field in which little has been done for libraries and for their peculiar problems. Studies are needed on fatigue, physical and mental. The suggested benefits of the interchange of personnel from department to department and from task to task need description and validation. That the traditional organization and planning of the technical processes may not be entirely effective has been suggested specifically in this study with respect to the "searching" activities.

The needs for facts on cost are not limited, of course, to the technical processes. Service operations require careful cost determination and study. The proposals concerning time-and-mo-

tion studies and other problems of management may be extended to any library activity.

All of these problems come to a focus in the need that exists for standards of cost that measure performance. One of the objectives of the early Cataloging Test was the establishment of a standard cost figure. Since that time the temptation to use published figures as criteria has been obvious, despite the fact that the figures may have been compiled under definitions and conditions that make comparison bootless. Only when conditions and procedures of work have been carefully described so that legitimate comparisons on this score may be made between libraries, and when the quality of performance is much the same, can the differences in cost be used to measure the efficiency of the organization and of the personnel.

Comparisons of cost figures are frequently made in the fields of municipal service and education. In the latter field, attempts have been made to establish criteria of quality⁸ and standards of reasonable cost for certain functions. Russell, in a study of effective and ineffective expenditures in colleges, devised a technique that is highly suggestive for the establishment of a standard cost for any library operation.⁹ To illustrate the technique, let it be assumed that a standard unit cost or a standard unit time for the cataloging of new books is desired. If unit costs and unit times, strictly defined and tabulated, were collected for a sample of libraries assumed to be, or limited by being, similar in type and function, these facts could be arranged in a distribution by libraries, ranging from highest time to lowest time, from highest cost to lowest cost. If over against this distribution a ranking of the libraries on the basis of excellence in cataloging was made and unsatisfactory performance indicated for those libraries doing poor work, a standard could be set up by noting the lowest unit cost or unit time at which *satisfactory performance* was possible. Libraries having higher figures would be

⁸ F. W. Reeves and J. D. Russell, "The measurement of college excellence," *Bulletin of the Bureau of School Service*, Vol. I, No. 4 (Lexington, Ky.: University of Kentucky, College of Education, 1929).

⁹ Russell, *op. cit.*

charged with ineffective expenditure. Libraries with lower figures would not be producing a standard grade of cataloging. The dependence of this technique upon a criterion of satisfactory performance indicates that a needed preliminary would be the definition of performance. Excellence in cataloging or other library activity may rest upon objective features that will define performance, but it seems likely, to draw a parallel from education, that these features cannot be validated except by expert subjective judgment.

If there is to be any practical value from comparative studies, certain precautions governing the execution of the studies and their use may be emphasized. "The failure of unit-cost studies . . . may be due, in part at least, to the following facts: first, the lack of an adequate and accurate procedure in conducting the studies; second, the failure properly to interpret cost figures; third, and perhaps of most significance, the failure to realize that merely the determination of unit costs does not solve financial and administrative problems."¹⁰

¹⁰ National Committee on Standard Reports for Institutions of Higher Education, *op. cit.*, p. 177.

